

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

In the claims:

Claim 1 (Original): A method of correcting errors in data retrieved from a storage medium, comprising:

retrieving a plurality of data blocks from the storage medium;

retrieving a plurality of redundancy blocks associated with the plurality of data blocks from the storage medium;

determining a number of data blocks with errors from the plurality of data blocks retrieved from the storage medium;

determining if the number of data blocks with errors exceeds a number of redundancy blocks retrieved from the storage medium; and

when the number of data blocks with errors exceeds the number of redundancy blocks, correcting the data blocks in data segments, wherein a data segment includes data from a portion of each of the plurality of data blocks retrieved from the storage medium.

Claim 2 (Original): The method of claim 1, further comprising:

when the number of data blocks with errors does not exceed the number of redundancy blocks, correcting the data blocks using the redundancy blocks.

Claim 3 (Original): The method of claim 1, wherein determining a number of data blocks with errors comprises:

retrieving a check sum associated with a retrieved data block from the storage medium;

generating a new check sum based on the retrieved data block; and

comparing the retrieved check sum with the new check sum to determine if the retrieved data block has errors.

Claim 4 (Original): The method of claim 3, wherein the check sum is a cyclic redundancy code.

Claim 5 (Original): The method of claim 1, wherein correcting the data blocks in data segments comprises:

for a data segment,

a) obtaining syndromes;

b) generating an error location polynomial based on the obtained syndromes;

c) determining an error location within the data segment using the error location polynomial;

d) generating an error value based on the determined error location within the data segment; and

e) correcting data at the determined error location within the data segment using the generated error value.

Claim 6 (Original): The method of claim 5, wherein a) further comprising:

generating one or more new redundancy blocks based on the retrieved data blocks;

generating one or more residual blocks based on the one or more new redundancy blocks and the retrieved redundancy blocks; and

for a data segment, generating syndromes based on the one or more residual blocks.

Claim 7 (Original): The method of claim 6, further comprising:

when the residual blocks for a data segment are zero,

determining that there are no errors in the data segment; and

repeating a) to e) for another data segment.

Claim 8 (Currently Amended): The method of claim 5, wherein b) ~~comprises:~~ comprises:

determining if there are less than two errors in the data segment based on the obtained syndromes and coefficients of the error location polynomial.

Claim 9 (Original): The method of claim 8, wherein when there are less than two errors in the data segment, determining a first error location within the data segment based on two of the obtained syndromes.

Claim 10 (Original): The method of claim 9, further comprising:

determining a second error location within the data segment based on two of the obtained syndromes, wherein at least one of the two syndromes used to determine the second error location is different than at least one of the two syndromes used to determine the first error location;, and wherein the first error location within the data segment is verified if the first and second error locations are the same.

Claim 11 (Original): The method of claim 10, further comprising:

determining a third error location within the data segment based on two of the obtained syndromes, wherein at least one of the two syndromes used to determine the third error location is different than at least one of the two syndromes used to determine the first and the second error locations, and wherein the first error location within the data segment is verified if the first, second, and third error locations are the same.

Claim 12 (Original): The method of claim 9, wherein the error value is one of the syndromes.

Claim 13 (Original): The method of claim 8, wherein when there are two errors in the data segment, solving the error location polynomial using a table.

Claim 14 (Original): The method of claim 8, wherein when there are two errors in the data segment, solving the error location polynomial using an exhaustive search to determine two error locations within the data segment with errors.

Claim 15 (Original): The method of claim 14, wherein the exhaustive search is performed at locations in the data segment corresponding to data blocks indicated by check sums as having errors.

Claim 16 (Original): The method of claim 14, wherein when more than two locations in the data segment are found to have error by performing the exhaustive search, determining that the data segment is not correctable.

Claim 17 (Original): The method of claim 14, wherein error values are generated based on the syndromes and the error locations.

Claim 18 (Original): The method of claim 5, wherein e) comprises:

multiplying the data at the determined error location with the generated error value to obtain a corrected data for the determined error location.

Claim 19 (Original): The method of claim 5, further comprising:

repeating a) to e) for another data segment.

Claim 20 (Original): A system of correcting errors in data retrieved from a storage medium, comprising:

a data buffer including:

a plurality of data blocks retrieved from the storage medium;

a plurality of redundancy blocks associated with the plurality of data blocks retrieved from the storage medium; and

a processor configured to:

determine a number of data blocks with errors from the plurality of data blocks retrieved from the storage medium;

determine if the number of data blocks with errors exceeds a number of redundancy blocks retrieved from the storage medium; and

when the number of data blocks with errors exceeds the number of redundancy blocks, correct the data blocks in data segments, wherein a data segment includes data from a portion of each of the plurality of data blocks retrieved from the storage medium.

Claim 21 (Original): The system of claim 20, further comprising:

when the number of data blocks with errors does not exceed the number of redundancy blocks, correcting the data blocks using the redundancy blocks.

Claim 22 (Original): The system of claim 20, wherein the data blocks are corrected in data segments by:

for a data segment,

a) obtaining syndromes;

b) generating an error location polynomial based on the obtained syndromes;

- c) determining an error location within the data segment using the error location polynomial;
- d) generating an error value based on the determined error location within the data segment; and
- e) correcting data at the determined error location within the data segment using the generated error value.

Claim 23 (Currently Amended): The system of claim 22, wherein b) ~~comprises~~ comprises:

determining if there are less than two errors in the data segment based on the obtained syndromes and coefficients of the error location polynomial.

Claim 24 (Original): The system of claim 23, wherein when there are less than two errors in the data segment, determining a first error location within the data segment based on two of the obtained syndromes.

Claim 25 (Original): The system of claim 24, wherein the error value is one of the syndromes.

Claim 26 (Original): The system of claim 23, wherein when there are two errors in the data segment, solving the error location polynomial using a table.

Claim 27 (Original): The system of claim 23, wherein when there are two errors in the data segment, solving the error location polynomial using an exhaustive search to determine two error locations within the data segment with errors.

Claim 28 (Original): The system of claim 27, wherein the exhaustive search is performed at locations in the data segment corresponding to data blocks indicated by check sums as having errors.

Claim 29 (Original): The system of claim 27, wherein when more than two locations in the data segment are found to have error by performing the exhaustive search, determining that the data segment is not correctable.

Claim 30 (Original): The system of claim 27, wherein error values are generated based on the syndromes and the error locations.

Claim 31 (Original): The system of claim 22, wherein e) comprises:

 multiplying the data at the determined error location with the generated error value to obtain a corrected data for the determined error location.

Claim 32 (Original): The system of claim 22, further comprising:

 repeating a) to e) for another data segment.

Claim 33 (Original): A computer-readable storage medium containing computer executable instructions for causing a computer to correct errors in data retrieved from a storage medium, comprising instructions for:

retrieving a plurality of data blocks from the storage medium;

retrieving a plurality of redundancy blocks associated with the plurality of data blocks from the storage medium;

determining a number of data blocks with errors from the plurality of data blocks retrieved from the storage medium;

determining if the number of data blocks with errors exceeds a number of redundancy blocks retrieved from the storage medium; and

when the number of data blocks with errors exceeds the number of redundancy blocks, correcting the data blocks in data segments, wherein a data segment includes data from a portion of each of the plurality of data blocks retrieved from the storage medium.

Claim 34 (Original): The computer-readable storage medium of claim 33, further comprising:

when the number of data blocks with errors does not exceed the number of redundancy blocks, correcting the data blocks using the redundancy blocks.

Claim 35 (Original): The computer-readable storage medium of claim 33, wherein correcting the data blocks in data segments comprises:

for a data segment,

- a) obtaining syndromes;
- b) generating an error location polynomial based on the obtained syndromes;
- c) determining an error location within the data segment using the error location polynomial;
- d) generating an error value based on the determined error location within the data segment; and
- e) correcting data at the determined error location within the data segment using the generated error value.

Claim 36 (Currently Amended): The computer-readable storage medium of claim 35, wherein b) ~~comprises~~ comprises:

determining if there are less than two errors in the data segment based on the obtained syndromes and coefficients of the error location polynomial.

Claim 37 (Original): The computer-readable storage medium of claim 36, wherein when there are less than two errors in the data segment, determining a first error location within the data segment based on two of the obtained syndromes.

Claim 38 (Original): The computer-readable storage medium of claim 37, wherein the error value is one of the syndromes.

Claim 39 (Original): The computer-readable storage medium of claim 36, wherein when there are two errors in the data segment, solving the error location polynomial using a table.

Claim 40 (Original): The computer-readable storage medium of claim 36, wherein when there are two errors in the data segment, solving the error location polynomial using an exhaustive search to determine two error locations within the data segment with errors.

Claim 41 (Original): The computer-readable storage medium of claim 40, wherein the exhaustive search is performed at locations in the data segment corresponding to data blocks indicated by check sums as having errors.

Claim 42 (Original): The computer-readable storage medium of claim 40, wherein when more than two locations in the data segment are found to have error by performing the exhaustive search, determining that the data segment is not correctable.

Claim 43 (Original): The computer-readable storage medium of claim 40, wherein error values are generated based on the syndromes and the error locations.

Claim 44 (Original): The computer-readable storage medium of claim 35, wherein e) comprises:

 multiplying the data at the determined error location with the generated error value to obtain a corrected data for the determined error location.

Claim 45 (Original): The computer-readable storage medium of claim 35, further comprising:

 repeating a) to e) for another data segment.